FILE

Forest Insect & Disease Management

Evaluation

S-17-76

COMPARISON OF ECTOMYCORRHIZAE OCCURRENCE ON PRUNED AND UNPRUNED ROOTS ON 3-0 RED PINE SEEDLINGS AT HAYWARD STATE NURSERY, HAYWARD, WISCONSIN, 1976

by

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INTRODUCTION During 1975, S&PF, Forest insect & Disease Management evaluated the Federal nurseries in the Lake States to determine the occurrence of mycorrhizae on red pine seedlings. The survey showed there was a reduction in mycorrhizal fungus infections from the fall 2-0 seedlings to the spring 3-0 seedlings. It was speculated that root pruning at the beginning of the third year might lower the amount of mycorrhizae present on these seedlings.

OBJECTIVE The purpose of this survey was to determine whether root pruning changed the percentages of mycorrhizal fungi significantly or affected growth patterns.

METHODS Eighty 3-0 seedlings with pruned roots and 80 3-0 seedlings with unpruned roots were lifted from the same bed at Hayward State Nursery. The seedlings were shipped to the laboratory in St. Paul for examination. Crown length, number of mycorrhizal feeder roots, total number of feeder roots and the percentage of the root system that was mycorrhizal was recorded for each group. Feeder roots were examined microscopically to determine mantle and Hartig Net formation.

RESULTS AND DISCUSSION Root-pruned seedlings had 26.8 percent (SE$_{\bar{x}}$ 1.2) of their root system classified ectomycorrhizae. Seedlings that had not been root-pruned, had 33.7 percent (SE$_{\bar{x}}$ 0.7) of their root system classified ectomycorrhizae. Using the T-test, we find that there is a significant difference between the 2 groups at the 95% level of confidence (T=4.57). The reduction in the percentage of feeder roots mycorrhizal does not seem to be large enough to cause any differences in the seedlings growth, since neither pruned or unpruned roots had sufficient mycorrhizae. Infection of 80% of the feeder roots is judged as adequate.

Seedlings that were not pruned, had an average crown length of 330mm and an average of 627 feeder roots. The root-pruned seedlings had an average crown length of 265mm and an average of 353 feeder roots. We suspect that the difference in seedling size is due to the larger root system and not to the 6.9 percent difference in occurrence of mycorrhizae.

CONCLUSIONS

1. There is a statistically significant difference between the percentage of mycorrhizal fungi on pruned and unpruned roots, of 3-0 red pine seedlings.
2. The unpruned seedlings had significantly larger root system and crowns than pruned seedlings.

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